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TI Epoxy resin compositions having good warping, soldering, and thermal shock
resistance and high-temperature storage stability and their use in semiconductor devices
IN Sameshima, Kenji
PA Sumitomo Bakelite Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 15 pp.
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DT Patent
LA Japanese
IC ICM C08L063-00
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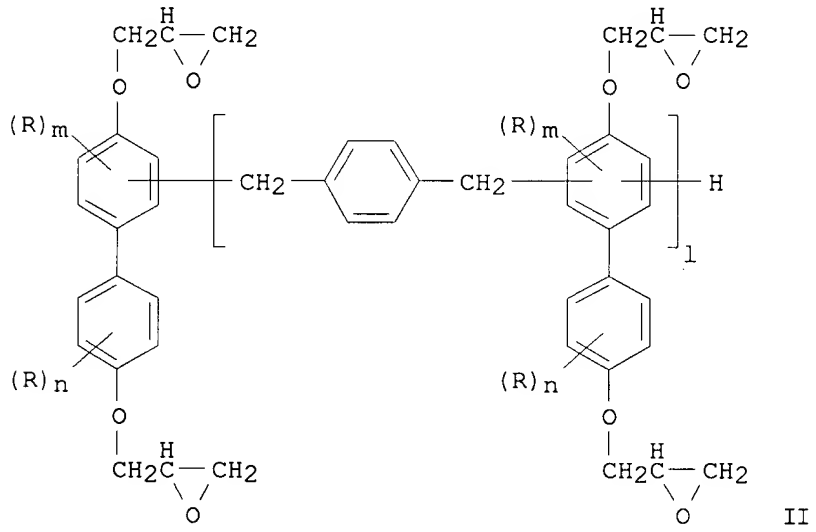
GI



II

AB The compns. for packaging semiconductors comprise (A) multifunctional epoxy resins GOC6H4-mRm[CH[C6H4-n(Rn)OG]C6H3-m(Rm)(OG)]lH (I) and/or MeC[C6H4-n(Rn)OG]2C6H4-p-CMe2Q1OG (R = same or different halo, C1-12 alkyl; G = glycidyl; Q1= Rn-substituted 1,4-phenylene; l = 1-10; m = 0-3; n = 0-4) and/or cryst. epoxy resins having m.p. 50-150.degree. selected from GOQ2OG, GOQOG, GOQCR':CR'QOG, GOQCH2QOG, and II [R' = same or different H, R; Q = p-C6R'4; R, Q1, l, m, and n are same as above], (B) phenolic resin curing agents HOC6H4-mRm[CH[C6H4-n(Rn)OH]C6H3-m(Rm)(OH)]lH (III) R, l, m, and n are same as above), (C) curing accelerators, (D) fused SiO2 powders, and (E) 0.3-5.0% (based on total compns.) red phosphorus-based fireproofing agents. Substantially, only a semiconductor

TPP ↓ warpage

element-mounted side of a substrate is sealed with the compns. in the devices. Thus, a compn. contg. Epikote 1032H (I, m = n = 0) 4.6, YX 4000H (3,3',5,5'-tetramethyl-4,4'-diglycidyloxybiphenyl, m.p. 105.degree.) 4.6, MEH 7500 (III, m = n = 0) 4.8, a fireproofing agent [obtained by coating red P with Al(OH)3 and then with a phenolic resin] 1.0, Ph3P 0.2, spherical fused SiO2 84.0 parts, and other additives was used to seal a semiconductor element to give a test piece showing good storage stability at 175.degree..

ST cryst epoxy resin semiconductor device packaging; warping resistance epoxy resin semiconductor packaging; storage stability epoxy resin semiconductor packaging; soldering resistance epoxy resin semiconductor packaging; thermal shock resistance epoxy resin semiconductor; phenolic resin curing agent epoxy resin; fused silica epoxy resin semiconductor packaging; red phosphorus fireproofing agent epoxy resin

IT Electronic packaging materials
Heat-resistant materials
Semiconductor devices
(epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)

IT Phenolic resins, uses
Phenolic resins, uses
RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); PREP (Preparation); USES (Uses)
(epoxy; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)

IT Phenolic resins, uses
RL: MOA (Modifier or additive use); USES (Uses)
(fireproofing agent component; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)

IT Phenolic resins, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(novolak, crosslinking agent; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)

IT Epoxy resins, uses
Epoxy resins, uses
RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); PREP (Preparation); USES (Uses)
(phenolic; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)

IT Fireproofing agents
(red phosphorus-based; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)

IT **112755-07-4**, MEH 7500
RL: DEV (Device component use); MOA (Modifier or additive use); USES

(Uses)
(crosslinking agent; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)
IT 603-35-0, Triphenylphosphine, uses
RL: CAT (Catalyst use); USES (Uses)
(curing accelerator; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)
IT 222053-12-5DP, polymers with phenolic resins 223591-58-0P 223591-60-4P
223591-61-5P 223591-62-6P 223596-22-3P
RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); PREP (Preparation); USES (Uses)
(epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)
IT 60676-86-0, Fused silica
RL: MOA (Modifier or additive use); USES (Uses)
(epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)
IT 7723-14-0, Red phosphorus, uses 21645-51-2, Aluminum hydroxide, uses
RL: MOA (Modifier or additive use); USES (Uses)
(fireproofing agent component; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)
IT **174882-88-3**, Epikote 1032H
RL: DEV (Device component use); POF (Polymer in formulation); PRP (Properties); USES (Uses)
(hydroxybenzaldehyde-phenol copolymer- and novolak-crosslinked; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)